

User's Manual



LGP Series Handheld CCD Scanner

25-ULGPMU01-01

April 2002

Keyboard Wedge Interface
USB Interface
RS232 Interface



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NOTICE

Opticon has taken every step to ensure that the information included in this manual is accurate, however we reserve the right to change any specification at any time without prior notice.

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Part I

General Information

The LGP-6125 Series CCD Scanners utilize state-of-the-art imaging technology similar to that found in digital cameras, facsimile machines and video camcorders. The scanner images the bar code label, then converts the digital signals into data the host computer can understand. By capturing the bar code image all at once, the scanner provides fast, highly accurate reading.

Miniature surface mount electronics make up the CCD scanner's solid state construction. CCD scanners have no moving mechanical parts and provide years of trouble-free operation.

This manual contains information on setting-up the scanner as well as programming various parameters of the scanner.

The LGP6125 scanner is available in several different interface configurations:

- Keyboard Wedge Interface
- RS232 Serial Interface
- USB Interface

There is a specific section of this manual for installing each type of interface. Be sure you are using the section of the manual that pertains to interface you are using.

Unpacking

Remove the scanner from its packaging and inspect it for damage. If the scanner was damaged in transit, call the dealer or distributor from whom you purchased it. If you purchased it directly from Opticon, call Opticon Customer Service Dept. at 800-636-0090.

Factory Technical Support

If you have any questions or need assistance with programming your scanner call Opticon Technical Support at 800-636-0090 please have the unit model number and several bar code labels readily at hand. The model number is located near the connector end of the cable.

If the scanner must be returned, please contact Opticon to obtain an RMA (Return Merchandise Authorization) number prior to returning the product. The Customer Service Dept. may be reached at 800-636-0090.

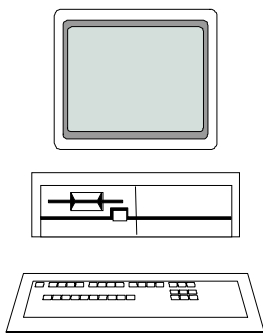
NOTE: Returned merchandise will not be accepted without a RMA number indicated clearly on the outside of the carton.

Part II Installation and SetUp

This section of the manual contains information on the physical installation of the scanner as well as certain programming options. There is a separate section for each type of interface. Check to see which type of interface your scanner has and turn to that section for information on installing the scanner

A.) Installation – Keyboard Wedge Interface


A "Y" connection cable is required for installation. The scanner is installed or "wedged" between the keyboard and the computer.. Your "Y" cable should have connectors for both a PS2 and AT type installation. The "Y" cable connects both the scanner and the keyboard to the computer.






The scanner must match the type of computer being used. The default setting is for an IBM AT type computer. If this type does not match the host computer, refer to the "Computer Type Selection" in the programming section that follows. If the connector does not match the host compute remove the short cable section, reverse it and insert it in the other connector

Reset All Defaults – Keyboard Wedge Interface

Our scanners are shipped with factory default settings that represent the settings most commonly used by our customers. In most applications, the scanner will work right out of the box without any need for additional programming. At any time you can return the scanner to the factory default settings. First scan the Start Program Menu bar code below, then scan the “Reset all Defaults” programming bar code, and then the End Program Menu bar.

NOTE: () A pointing finger indicates default settings throughout the following menus.







ZZ	Start Program Menu	
UB	Reset All Defaults (AT Wedge)	
ZZ	End Program Menu	



Computer Type Selection (for Keyboard Wedge only)

The Keyboard Wedge interface scanner is designed to operate with an IBM personal computers and compatibles along with a Macintosh PC's. Select the host computer type from the menu below.

NOTE: If the scanner has not been set to the correct host computer, the scanner may display random characters on the screen after reading a bar code label.

ZZ	Start Program Menu	
UA	IBM PC/XT	
UB	IBM AT & compatibles	
UD	HP Vectra	
UM	Macintosh	
ZZ	End Program Menu	







Keyboard Wedge and USB options

With Keyboard: Use this mode in case a keyboard is connected to the PC wedge Y-cable. The Wedge is only listening in case the computer is booting or the wedge is idle.

Without Keyboard: Use this mode in case no keyboard is connected to the PC wedge Y- cable. In some cases, this mode is required when a PC USB keyboard is connected. If this option is enable, the computer detects the wedge as a keyboard. If the computer reports a keyboard error or in case no data is displayed, try this option. It is required to power OFF the PC, wait 10 seconds and power ON the PC.














NOTE: Do not enable 'without keyboard' option when a keyboard is connected to the Y cable. The 'without keyboard' option is only supported for PC/AT wedges.

ZZ	Start Program Menu	
KM	With keyboard	
KL	Without keyboard	
ZZ	End Program Menu	



Intercharacter Delay for Keyboard Wedge interface

The scanner may send data faster than the computer or application program can accept. This is called "keyboard buffer overrun". If data appears to be missing, random read errors occur or the scanner locks up and will not scan, experiment with the various keyboard timing options listed in the menu to follow.

ZZ	Start Program Menu	
LA	No Delay	
LB	Delay = 1	
LC	Delay = 2	
LD	Delay = 3	
LE	Delay = 4	
LF	Delay = 5	
LG	Delay = 6	
LH	Delay = 7	
LI	Delay = 8	
LJ	Delay = 9	
LK	Delay = 10	
ZZ	End Program Menu	

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B.) Installation – RS232 Interface




The RS-232 scanner cable is terminated in with a DB9 female connector. An external power supply (+5V DC) may be necessary. There is a power supply jack on the RS-232 connector.

Installation is as follows:

1. Plug the scanner into an RS232 serial port (such as COM1) of the host PC. If external power is required, insert external power plug into the jack on the RS-232 connector.
2. Connect the power supply into an electrical outlet (110 V AC)
3. Turn on the power to the host computer. Make sure the communication parameters of the computer match those of the scanner. The default communications settings are: 9600 baud, 8 data bits, 1 stop bit, no parity, no handshaking
4. Be sure the PC is in a program (such as WordPad) that will accept input from the serial port.












Reset All Defaults – RS232

Our scanners are shipped with factory default settings that represent the settings most commonly used by our customers. In most applications, the scanner will work right out of the box without any need for additional programming. At any time you can return the scanner to the factory default settings by scanning the “Reset all Defaults” programming bar codes below. First scan the Start Program Menu bar code below, then scan the “Reset all Defaults” programming bar code, and then the End Program Menu bar.








ZZ	Start Program Menu	
U2	RS232 Reset all defaults	
ZZ	End Program Menu	

RS-232C Communication Parameters












Handshaking Protocol

ZZ	Start Program Menu		
P0	None		
HP04	RTS/CTS		
P3	ACK/NAK		
ZG	Xon/Xoff		
I0	Flow Control Time Unlimited		
I1	Flow Control: 100ms		
I2	Flow Control: 200ms		
I3	Flow Control: 400ms		

Baud Rate

K7	19200		
K6	9600		
K5	4800		
K4	2400		
K3	1200		
K2	600		

Data Bits / Stop Bits / Parity




L0	7 Data Bits		
L1	8 Data Bits		
L5	1 Stop Bit		
L6	2 Stop Bits		
L3	Even Parity		
L4	Odd Parity		
L2	Mark No Parity		
ZZ	End Program Menu		

C.) Installation – USB Interface

Plug the scanner into the USB connector on your host computer. PC must be running Windows 98 or higher or iMac Rev A or higher. The computer will sense the presence of the scanner and load any required software drivers automatically.

Reset All Defaults - USB Interface

Our scanners are shipped with factory default settings that represent the settings most commonly used by our customers. In most applications, the scanner will work right out of the box without any need for additional programming. At any time you can return the scanner to the factory default settings by scanning the “Reset all Defaults” programming bar code below.

<i>ZZ</i>	Start Program Menu	
<i>SU</i>	USB	
<i>ZZ</i>	End Program Menu	

Part III

Bar Code Menu Functions

Section A Programming the Scanner

This manual contains information that allows you to easily change certain programmable parameters of the scanner. The scanner is ready to use - no additional programming is required in most situations. The scanner has been programmed at the factory with the most common settings. These factory default settings are ideal for most situations.

A specific parameter is set or changed by scanning one or more of the special programming bar codes found on the following pages. For each parameter, you can choose from a menu of options. When you scan the special bar code for a specific menu option, the scanner retains the changes you have made even if you disconnect the scanner or turn off the power.

Step-by-Step

Programming is easy. Simply:

1. Scan the bar code for "**Start/End Program Menu**" (ZZ). The scanner will beep continuously to indicate that it is ready to be programmed. When the scanner is in Programming Mode, it cannot read normal bar code. It can only read the special bar codes found on the following pages.
2. Select desired parameter from menu and scan the bar code. The scanner will beep once and the green light will flash, indicating the desired parameter has been scanned. The scanner will continue to beep continuously while in Programming Mode.
3. Scan "**Start/End Program Menu**" (ZZ). The scanner will stop beeping, indicating that it is back in normal scanning mode. The changes made while in Programming Mode are now saved in the scanner's memory.













When the scanner is in Programming Mode, more than one parameter at a time can be changed. Until some proficiency at programming is achieved, it is highly recommended that users only change only one parameter at a time and test the change before proceeding to program any additional changes. It is also recommended that users keep a record of the changes made to the scanner.

What If I Make A Mistake?

Scanning the "**Reset All Defaults**" bar code for your type of interface will return the scanner to all factory default settings (including any changes made during previous programming sessions).

NOTE: () A pointing finger indicates scanner default settings throughout the following menus.










Symbology Selection

ZZ	Start/End Program Menu	
A0	Read all codes	
A2	Code 39 only	
A3	Codabar only	
A4	IATA only	
A5	Code 93 only	
A6	Code 128 only	
A7	MSI/Plessey only	
A9	Telepen only	
AB	Matrix 2of5 only	
J0	All UPC and EAN only	
J1	UPC only	



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Symbology Selection (continued)

ZZ	Start/End Program Menu	
J2	UPC+2 only	
J3	UPC+5 only	
J4	EAN only	
J5	EAN+2 only	
J6	EAN+5 only	
J7	Industrial 2of5 only	
J8	Interleaved 2of5 only	
JD	Trioptics only	

These options do not influence the reading of the menu labels. The required bar code types can be selected by enabling a single readable code only and enabling a single readable code only and enabling readable codes. It is strongly recommended that only the required codes be selected.







Symbology Additions

If scanner will not be used to read all symbologies (default setting), speed operation by using this menu to add only the specific symbologies being used (add only the symbologies that are required).







<i>ZZ</i>	Start/End Program Menu	
B0	Disable all	
B2	Enable Code 39	
B3	Enable Codabar	
B4	Enable IATA	
B5	Enable Code 93	
B6	Enable Code 128	
B7	Enable MSI/Plessey	
B9	Enable Telepen	
JZ	Enable Trioptics	
R1	Enable UPC	
R2	Enable UPC+2	
R3	Enable UPC+5	

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Symbology Additions (continued)

ZZ	Start/End Program Menu	
R4	Enable EAN	
R5	Enable EAN+2	
R6	Enable EAN+5	
R7	Enable Industrial 2of5	
R8	Enable Interleaved 2of5	

Setting the Number of Characters to be Scanned

ZZ	Start/End Program Menu	
H0	Fixed length OFF all codes	
H1	Fixed length ON all codes	
HK	Fixed length ON selected codes	
HL	Min. length selected codes	
HM	Max. length selected codes	



Setting Code Specific Options - Options for specific codes may be configured affecting:

- * Enabling and disabling code variants and translations.
- * Data verification such as by mean of a check digit calculation. A check digit has a value that can be calculated from the other data characters and is usually the last data character in a bar code.

- * Pre-editing of the data string such as removing the check digit and/or ST/SP characters.

The more common options are described here.

Check CD - Enables the check digit calculation. If the calculated check digit does not correspond to the check digit in the bar code, then the bar code is ignored. The use of a check digit greatly improves the security of a bar code.

Do Not Check CD - Disables the check digit calculation. This option is required when the bar codes do not contain a check digit or contain an invalid check digit.

Transmit CD - Enables the transmission of the check digit together with the data characters. If the check digit calculation is disabled, the reader cannot differentiate anymore between a (valid) check digit and a data character. It will therefore transmit all data characters of the label, including what could constitute a check digit.

Do Not Transmit CD - Disables the transmission of the check digit. If the check digit calculation is disabled, the reader cannot differentiate between a (valid) check digit and a data character. It will therefore transmit all data characters of the label, excluding the character that could constitute the check digit for the type of bar code.















Transmit ST/SP - Enables the transmission of the start and stop characters of a bar code.

Do Not Transmit ST/SP - Disables the transmission of the start and stop characters of a bar code.

UPC-A/E Settings

Options for UPC-A and UPC-E bar codes.

NOTE: Abbreviations: Xmit = transmit; CD = Check digit; CC = Country code

ZZ	Start/End Program Menu		
E2	UPC-A as EAN13 w/ CD (13 digits)		
E3	UPC-A w/ CD (12 digits)		
E4	UPC-A w/ CD (12 digits)		
E5	UPC-A w/o CD (11 digits)		
E6	UPC-E w/ CC & CD (8 digits)		
E7	UPC-E w/o CC, w/ CD (7 digits)		
E8	UPC-E w/ CC, w/o CD (7 digits)		
E9	UPC-E w/o CC & CD (6 digits)		
6P	Xmit UPC-E as UPC-A w/ CD (8 digits)		
6Q	Do not xmit UPC-E as UPC-A w/o CD (7 digits)		

UPC Settings (continued)

Options for UPC-A - The UPC-A symbology is a fixed length symbology encoding 11 data digits, a check digit and non printable start/stop characters. Supported characters are numeric digits 1 to 9.

An optional leading zero can be transmitted which, together with the data and the check digit, forms a 13 digit field providing compatibility with the EAN-13 format.

String format:

Leading	data	check
0	(11 digits)	digit

UPC-A add-on 2/add-on 5 - The UPC-A symbology as described above can be succeeded by an additional 2 or 5 digit UPC-A code.

String format:

Leading	data	check	add-on
0	(11 digits)	digit	2 or 5

Options for UPC-A

* Disable transmission of the leading zero

* Disable transmission of the check digit

Options for UPC-E - The UPC-E symbology is a fixed length symbology encoding 6 data digits, a check digits and non printable start/stop characters. Supported characters include numeric digits 0 to 9. An optional leading zero can be transmitted which, together with the data and the check digit, forms an 8 digit field providing a compatibility with the EAN-8 format.

String format:

Leading	data	check
0	(6 digits)	digit

UPC-E add-on 2/add-on 5 - The UPC-E symbology as described above can be succeeded by an additional 2 or 5 digit UPC-A code.

String format:

Leading	data	check	add-on
0	(6 digits)	digit	2 or 5
















Options for UPC-E

* Enable transmission of the leading zero

* Disable transmission of the check digit

* Transmit UPC-E as UPC-A

EAN-13 and EAN-8 Settings

ZZ	Start/End Program Menu		
6K	EAN-13 transmit CD		
6J	EAN-13 do not transmit CD		
6I	EAN-8 transmit CD		
6H	EAN-8 do not transmit CD		
IB	Disable ISBN translation		
IA	Enable ISBN translation		
IK	Enable ISBN if possible		
HN	Disable ISSN translation		
HO	Enable ISSN translation		
4V	Enable ISSN if possible		

EAN-13 and EAN-8 Settings

EAN-13 is a fixed length symbology encoding 12 data digits, a check digit and non printable start/stop characters. Supported characters are numeric digits 0 to 9. The data may be translated into ISBN or ISSN format.

String format:

data (12 digits)	check digit
---------------------	----------------

EAN-13 add-on 2/add-on 5 - The EAN-13 symbology as described above can be succeeded by an additional 2 or 5 digit UPC-A code.

String format:

data (12 digits)	check digit	add-on 2 or 5
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EAN-8 is a fixed length symbology encoding 7 data digits, a check digit and non printable start/stop characters. Supported characters are numeric digits 0 to 9.

String format:

data (7 digits)	check digit
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EAN-8 add-on 2/add-on 5 - The EAN-8 symbology as described above can be succeeded by an additional 2 or 5 digit UPC-A code.

String format:

data (7 digits)	check digit	add-on 2 or 5
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Options for EAN

* Disable transmission of the check digit

* Enable ISBN or ISSN translation

Enable ISBN or ISSN translation - If this option is enabled, an EAN-13 label is verified for the correct format and transmitted as a 10 digit ISBN number or 8 digit ISSN number.

Code 39 Settings

ZZ	Start/End Program Menu		
C0	Check CD		
C1	Do not check CD		
D0	Xmit ST/SP		
D1	Do not xmit ST/SP		
D4	Full ASCII		
D5	Normal Code 39		
D8	Do not xmit CD		
D9	Xmit CD		
+K	Full ASCII Code 39 if possible		
+L	Enable concat-enation		
+M	Disable concat-enation		
8D	Minimum 3 digits		
8E	Minimum 1 digit		

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Code 39 Settings (continued)

Code 39 is a variable length symbology with an optional check digit ("CD") and printable start/stop ("ST/SP") characters. The following characters are supported:

- Numeric characters 0 to 9
- Alpha characters capital A to Z
- Special characters - \$ / + % and SPACE
- Start/stop character is *

The checksum is calculated as the sum modulo 43 of the numerical value of the data characters.

In full ASCII mode, all 128 ASCII characters are supported. This is done by combining one of the characters +, %, \$ or / with one of the alpha characters (A to Z).

String format:

start char.	data (0 or more characters)	check digit	stop char.
----------------	--------------------------------	----------------	---------------

Options for Code 39:

- * Enable full ASCII conversion
- * Enable Italian Pharmaceutical conversion
- * Enable check digit
- * Disable transmission of the check digit
- * Enable transmission of start/stop
- * Enable leading A for Italian Pharmaceutical
- * Selection of the minimum number of data characters














Normal Code 39 - In this mode the decoded data characters are transmitted without further translation.

Full ASCII Code 39 - In this mode the decoded data characters are translated to full ASCII Code 39.

Full ASCII Code 39 if possible - In this mode the decoded data characters are translated to full ASCII code 39. Invalid combinations are not translated and are transmitted as is.

Concatenation - If a Code 39 bar code contains a leading space, the data is stored into the reader's buffer without the leading space. As soon as a Code 39 bar code is read without a leading space, the data is appended to the reader's buffer and the entire buffer is transmitted and cleared for new data. In case a non Code 39 bar code bar is transmitted and the buffer is cleared. The buffer size is reader dependant.














Codabar Settings

ZZ	Start/End Program Menu	
F0	Do not transmit start/stop	
F1	Transmit start/stop as ABCD/TN*E	
F2	Transmit start/stop as abcd/tn*e	
F3	Transmit start/stop as ABCD/ABCD	
F4	Transmit start/stop as abcd/abcd	
H3	Enable Codabar, ABC and CX	
H4	Enable only ABC code	
H5	Enable only CX code	
H6	Check CD	
H7	Do not check CD	
H8	Transmit CD	
H9	Do not transmit CD	



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Codabar Settings (continued)

ZZ	Start/End Program Menu		
HA	Enable Codabar normal mode only		
HB	Min. data 3 chars.		
HC	Min. data 1 char.		
HD	Enable space insertion		
HE	Disable space insertion		
HF	Min. data 5 chars.		
HH	Enable interchar. gap check		
HI	Disable interchar. gap check		

Codabar Settings

Codabar (NW7) is a variable length symbology with an optional check digit and printable start/stop characters. Supported characters include:

- * Numeric digits 0 to 9
- * special characters - \$: / , +
- * start/stop characters are A, B, C or D

The checksum is calculated as the sum modulo 16 of the numerical values of all data characters.

String format:

start char.	data (1 or more chars.)	check digit	stop char.
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Codabar Settings (continued)

ABC-Code - The ABC code is an acronym for American Blood Commission. The code consists of two bar codes which are decoded in one read cycle. the code is concatenated when the stop character of the first bar code and the start character of the second bar code is a D. These two D's are not transmitted.

String format:

start char.	data (1+ chars.)	check digit	data (1+ chars.)	check digit	stop char.
----------------	---------------------	----------------	---------------------	----------------	---------------

CX-Code - The CX-Code consists of two are codes which are decoded in one read cycle. The code is concatenated when the stop character of the first bar code is a C, and the start character of the second bar code is a B. The B and C characters are not transmitted.

String format:

start char.	data (1+ chars.)	check digit	data (1+ chars.)	check digit	stop char.
----------------	---------------------	----------------	---------------------	----------------	---------------

Options for Codabar:

- * Enable ABC code concatenation.
- * Enable CD code concatenation.
- * Enable check digit check.
- * Disable transmission of the check digit.
- * Disable transmission of start/stop.
- * Selection of start/stop character translation.
- * Selection of minimum number of data characters.
- * Enable library space (CLSI) insertion.
- *















Space insertion - This option inserts spaces in position 2, 7 and 13 of the data string for use in library systems.

ST/SP translation - This option enables the translation and transmission of the start and stop characters. Thus, if the option ST/SP: abcd/tn*e is chosen, the start character is converted to lower case, e.g. from A, B, C or D to a, b, c or d, respectively), and the stop character is converted from A, B, C or D to t, n, * or e, respectively.

Minimum data characters - Codabar labels are checked for a minimum of 1, 3 or 5 characters as set by the user. If the number of characters in the label is shorter than the minimum selected, the label will be rejected. If the fixed length option is used for Codabar type labels, then such labels will additionally be checked for fixed length. This option will no longer be supported in future software releases.

Intercharacter gap check - This option enables the reading of Codabar labels with a large or irregular gap between characters.

2of5 Settings

ZZ	Start/End Program Menu		
E0	Transmit CD		
E1	Do not transmit CD		
G0	Do not check CD		
G1	Check CD		
GE	Min. data 1 char.		
GF	Min. data 3 chars.		
GI	Min. data 5 chars.		
GJ	Enable space check for Industrial 2of5		
GK	Disable space check for Industrial 2of5		

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2of5 Settings (continued)

Code 2of5 is a variable length symbology with an optional check digit and non printable start and stop character. Supported characters include numeric digits 0 to 9.

The checksum is calculated as the sum modulo 10 of the numerical values of all the data characters. The following 2of5 codes are supported.

Industrial 2of5 (D 2of5) - This symbology encodes a pair of digits in each symbol, the number of digits are therefore always an even number. Information is carried in the bars and spaces. The start and stop pattern is not unique inside the code. It is therefore essential to use the fixed length option to prevent partial reads.

Matrix 2of5 - This symbology encodes 1 digit in each character, the number of digits can therefore be an odd or an even number. Information is carried in the bars and spaces.

String format - Industrial, Interleaved or Matrix 2of5:

leading zero	data (1 or more digits)	check digit
-----------------	----------------------------	----------------










Options for Code 2of5:

- * Disable transmission of the check digit
- * Enable check digit check
- * Selection of the minimum number of data characters
- * Disable space check for industrial 2of5
- * Transmit S Code as Interleaved 2of5
- *

Minimum data characters - Code 2of5 are checked for a minimum of 1, 3 or 5 characters as set by the user. If the number of characters in the label is less than the number set, the label will be rejected. If the fixed length option is used for a Code 2of5 type label, then such label will also be checked for fixed length.

Intercharacter gap check - This option enables the reading of Industrial 2of5 labels with a large or irregular spacing.

MSI/Plessey Settings

ZZ	Start/End Program Menu		
4A	Do not check CD		
4B	Check 1 CD = Mod 10		☞
4C	Check 2 CD's = Mod 10 /Mod 10		
4D	Check 2 CD's = Mod 10 /Mod 11		
4E	Transmit CD1		☞
4F	Transmit CD1 and CD2		
4G	Do not transmit CD		
4R	Check 2 CD's = Mod 11 /Mod 10		

MSI Plessey is a variable length symbology with one or two optional check digit calculations CD1 and CD2 and non printable start/stop characters. Supported characters include numeric digits 0 through 9.

The checksum is calculated as the sum modulo 10 or 11 of the data characters. The checksum CD2 is calculated as the sum modulo 10 or 11 of the data characters and CD1.

String format:

data (1 to 13 digits)	CD1	CD2
-----------------------	-----	-----

Options for MSI/Plessey:

- * Disable check digit check.
- * Selection of the check digit calculation.
- * Selection of the number of check digits to be transmitted.









Check digit - If the check digit calculation is required, then the appropriate calculation method must be selected.

Do not transmit CD - The character positions CD1 and CD2 are not transmitted.

Transmit CD1 - The character position CD2 is not transmitted.

Transmit CD1 and CD2 - All characters in the label are transmitted.

Code 128, EAN 128 Settings

ZZ	Start/End Program Menu		
JF	Enable EAN 128 only		
MO	Enable FNC2 concatenation		
MP	Disable FNC2 concatenation		
OF	Disable EAN 128		
OG	Enable EAN 128 if possible		

Code 128 is a variable length symbology with a mandatory check digit and non-printable start/stop characters. Supported characters include:

- * All 128 ASCII characters;
- * 4 non data function characters;
- * 4 code set selection characters;
- * 3 start characters; and
- * 1 stop character.

The check is calculated as the sum modulo 103 of the start character and the weighted values of the data and special characters.

String format: data (1 or more characters)

EAN 128 - In this mode, the Code 128 data is translated to the EAN 128 format. EAN 128 data starts with the FNC1 character and separates 2 data fields with the FNC1 character. The first FNC1 character is translated to]C1, and the second FNC1 character is translated to ASCII GS (hex 1D) character.

String format:










]C1	data characters	<GS>	data characters
-----	--------------------	------	--------------------

Enable EAN 128 only - In the mode, the decoded data characters are translated to the EAN 128 format. If the data does not comply with the EAN 128 format, then the label is rejected.

Enable EAN 128 if possible - In this mode, the decoded data characters are translated to the EAN 128 format. If the data does not comply with the EAN 128 format, then the label is transmitted as Code 128.

FNC2 Concatenation - If a Code 128 bar code contains a leading FNC2 character, the data is stored into the reader's buffer. As soon as a Code 128 bar code is read without a leading FNC2 character, the data is appended to the reader's buffer and the entire buffer is transmitted and cleared for new data. In case a non Code 128 bar code is read, the data in the non-Code 128 bar code is transmitted and the buffer is cleared. The buffer size is reader dependent.

IATA Settings

ZZ	Start/End Program Menu		
4H	Do not check CD		
4I	Check S/N only		
4J	Check CPN, S/N		
4K	Check CPN, airline and S/N		
4L	Transmit CD		
4M	Do not transmit CD		

IATA is a variable length symbology with an optional check digit and non printable start/stop characters. Supported characters include numeric digits 0 through 9.

The checksum is calculated as the modulo seven of the data string. IATA is acronym for International Air Transport Association.





String format - A possible format of IATA is as follows:

Code	CPN	AC	FC	SN	CD
Description	Coupon	Airline Code	Form Code	Serial Number	Check Digit
Digits	1	3	2	8	15

Options for IATA:

- * Enable check digit check.
 - * Selection of the check digit calculation.
 - * Disable transmission of the check digit.
- Check digit** - If the check digit calculation is required, then the appropriate calculation method must be selected.

Telepen Settings

ZZ	Start/End Program Menu		
D2	Numeric mode		
D3	ASCII mode		

Telepen is a variable length symbology with a check digit and non printable start/stop characters. Supported characters include numeric digits 00 through 99 in numeric mode, and all 128 ASCII characters in full ASCII mode. The check digit calculation is derived from the sum of all data characters modulo 127. The check digit cannot be transmitted.






String format:

Data (1 to 32 characters)

Options for Telepen:

* Selection of full ASCII mode.

Case Conversion

ZZ	Start/End Program Menu	
YZ	No case conversion	
YW	Convert to upper case	
YX	Convert to lower case	
YY	Exchange case	



String Options - This section describes the alterations which can be made to the format of the transmitted data string. Options available are:

- * Case conversion
- * Transmission of a code identifier
- * Transmission of the code length
- * Transmission of a prefix
- * Transmission of a suffix

The prefix and/or suffix may include a code identifier and/or the code length.

String format:

prefix	bar code data	suffix
--------	---------------	--------

Case conversion - The bar code may be converted to either lower of upper case or the case may be exchanged. These options may be used if the user of a wedge has a preference to leave, for instance, the CAPSLOCK ON or if the host required upper case characters only.












Setting a Prefix or Suffix

A Prefix and Suffix consisting of a maximum 4 direct input entries each may be included in front and at the end of the string, respectively.

The following steps are used to establish a Prefix or Suffix that will be transmitted with the bar code data.













- 1) Scan Start/End Program Menu to enter programming mode.
- 2) Scan the bar code representing the desired symbology you wish to add a Prefix or Suffix to.
- 3) Scan the character(s) that comprise the Prefix or Suffix. Up to 4 numbers, letters or control characters may be used.
- 4) Scan Start/End Program Menu to exit programming mode.

Prefix Settings
















ZZ	Start/End Program Menu	
GL	Matrix 2of5	
I8	IATA	
L8	Telepen	
M0	UPC-A + add-on	
M1	UPC-E + add-on	
M2	EAN-13 + add-on	
M3	EAN-8 + add-on	
M4	Code 39	
M5	Codabar	
M6	Industrial 2of5	

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Prefix Settings (continued)









ZZ	Start/End Program Menu	
M7	Interleaved 2of5	
M8	Code 93	
M9	Code 128	
N0	MSI/Plessey	
N1	UPC-A	
N2	UPC-E	
N3	EAN-13	
N4	EAN-8	
RY	All codes	
MG	Clear all prefixes	
MZ	Preamble	

Suffix Settings
















ZZ	Start/End Program Menu	
GM	Matrix 2of5	
I9	IATA	
L9	Telepen	
N5	MSI/Plessey	
N6	UPC-A	
N7	UPC-E	
N8	EAN-13	
N9	EAN-8	
O0	UPC-A + add-on	
O1	UPC-E + add-on	
O2	EAN-13 + add-on	
O3	EAN-8 + add-on	
O4	Code 39	
O5	Codabar	

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Suffix Settings (continued)
















ZZ	Start/End Program Menu	
O6	Industrial 2of5	
O7	Interleaved 2of5	
O8	Code 93	
O9	Code 128	
PR	Clear all suffixes	
PS	Postamble	
RZ	All Codes	

Direct Input Keyboard Keys

ZZ	Start/End Program Menu	
8J	F1	
8K	F2	
8L	F3	
8M	F4	
8N	F5	
8O	F6	
8P	F7	
8Q	F8	
8R	F9	
8S	F10	
8T	F11	
8U	F12	
9X	Backspace	
7H	TAB	

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Direct Input Keyboard Keys (continued)

ZZ	Start/End Program Menu	
7I	Carriage return	
7Q	Enter (numeric pad)	
7R	Enter make (alpha pad)	
7S	Enter make and break (alpha pad)	
7J	ESC	
7K	Arrow down	
7L	Arrow up	
7M	Arrow right	
7N	Arrow left	
7T		
VQ	<INSERT>	
VR	<HOME>	
VS	<END>	
7O	Page up	


















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Direct Input Keyboard Keys (continued)
















ZZ	Start/End Program Menu	
7P	Page down	
7U	Left <Shift>	
7W	Left <Ctrl>	
7Y	Left <Alt>	
7V	Right <Shift>	
7X	Right <Ctrl>	
7Z	Right <Alt>	
9S	CAPSLOCK	

Direct Input Characters

ZZ	Start/End Program Menu	
5A	<SPACE>	
5B	!	
5C	"	
5D	#	
5E	\$	
5F	%	
5G	&	
5H	'	
5I	(
5J)	
5K	*	
5L	+	
5M	,	
5N	-	







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Direct Input Characters (continued)

ZZ	Start/End Program Menu	
5O	.	
5P	/	
6A	:	
6B	;	
6C	<	
6D	=	
6E	>	
6F	?	
6G	@	
7A	[
7B	\	
7C]	
7D	^	
7E	_	















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Direct Input Characters (continued)

ZZ	Start/End Program Menu	
7F	`	
9T	{	
9U		
9V	}	
9W	~	
















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Direct Input Characters (continued)

ZZ	Start/End Program Menu	
Q0	0	
Q1	1	
Q2	2	
Q3	3	
Q4	4	
Q5	5	
Q6	6	
Q7	7	
Q8	8	
Q9	9	
0A	A	
0B	B	
0C	C	
















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Direct Input Characters (continued)

ZZ	Start/End Program Menu	
0D	D	
0E	E	
0F	F	
0G	G	
0H	H	
0I	I	
0J	J	
0K	K	
0L	L	
0M	M	
0N	N	
0O	O	
0P	P	
0Q	Q	
















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Direct Input Characters (continued)

ZZ	Start/End Program Menu	
0R	R	
0S	S	
0T	T	
0U	U	
0V	V	
0W	W	
0X	X	
0Y	Y	
0Z	Z	
\$A	a	
\$B	b	
\$C	c	
\$D	d	
\$E	e	









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Direct Input Characters (continued)
















ZZ	Start/End Program Menu	
\$F	f	
\$G	g	
\$H	h	
\$I	i	
\$J	j	
\$K	k	
\$L	l	
\$M	m	
\$N	n	
\$O	o	
\$P	p	
\$Q	q	
\$R	r	
\$S	s	

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Direct Input Characters (continued)
















ZZ	Start/End Program Menu	
\$T	t	
\$U	u	
\$V	v	
\$W	w	
\$X	x	
\$Y	y	
\$Z	z	

Direct Input Control Characters

ZZ	Start/End Program Menu	
9G	^@(NULL)	
1A	^A(SOH)	
1B	^B(STX)	
1C	^C(ETX)	
1D	^D(EOT)	
1E	^E(ENQ)	
1F	^F(ACK)	
1G	^G(BEL)	
1H	^H(BS)	
1I	^I(HT)	
1J	^J(LF)	
1K	^K(VT)	
1L	^L(FF)	
1M	^M(CR)	







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Direct Input Control Characters (continued)




ZZ	Start/End Program Menu	
1N	^N(SO)	
1O	^O(SI)	
1P	^P(DLE)	
1Q	^Q(DC1)	
1R	^R(DC2)	
1S	^S(DC3)	
1T	^T(DC4)	
1U	^U(NAK)	
1V	^V(SYN)	
1W	^W(ETB)	
1X	^X(CAN)	
1Y	^Y(EM)	
1Z	^Z(SUB)	
9A	^[(ESC)	

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Direct Input Control Characters (continued)

ZZ	Start/End Program Menu	
9B	^(FS)	
9C	^(GS)	
9D	^(RS)	
9E	^(US)	
9F	DEL (ASCII 127)	

Direct Input Code ID/Length

ZZ	Start/End Program Menu	
\$2	Code identification	
\$3	Code length	

Read Mode Settings

ZZ	Start/End Program Menu		
S0	Single read		
S1	Multiple read		
S2	Continuous read		
XA	Add-on wait mode disabled		
XB	Add-on wait mode 0.25 sec.		
XC	Add-on wait mode 0.50 sec.		
XD	Add-on wait mode 0.70 sec.		




Single Read - When a bar code has been decoded, the reader will be turned OFF. The reader must be triggered again to read another label. This option and "Disable trigger" cannot be programmed at the same time.

Multiple Read - When a bar code has been decoded, the reader will stay ON for a time as set by "read time settings" or indefinitely if the trigger switch has been disabled. The same label can only be decoded again after the label has not been detected for a number of scans.

Continuous Read - The reader will produce as much data as it can decode regardless whether it is the same or not. This mode is mainly used for demonstration and diagnosis.









Add-on Wait Mode - Used if UPC/EAN with add-on is enabled. The reader searches within the selected time for a valid add-on code. If a valid add-on code is found, the reader transmits the data immediately. If nothing is found behind the code, the scanner will transmit the data without add-on. If something is found behind the code, the reader ignored the code in case it is not a valid add-on.

Trigger Settings

ZZ	Start/End Program Menu	
S7	Disable trigger	
S8	Enable trigger	

Disable Trigger - This is applicable to readers which have a trigger switch. When this option is selected, the reader will stay ON all the time.










Multiple Read Reset Time

ZZ	Start/End Program Menu	
AH	50 ms	
AI	100 ms	
AJ	200 ms	
AK	300 ms	
AL	400 ms	
AM	500 ms	
AN	600 ms	



Multiple Read Reset Time - This option can be used in conjunction with multiple read mode. It sets the time the reader should be pointed away from the label before it can decode the same label again.













Quiet Zone Settings

ZZ	Start/End Program Menu	
YN	No margin check	
YO	Margin check 1/7 normal	
YP	Margin check 2/7 normal	
YQ	Margin check 3/7 normal	
YR	Margin check 4/7 normal	
YS	Margin check 5/7 normal	
YT	Margin check 6/7 normal	
YU	Margin check normal	



With these settings, the reader can decode bar codes that have smaller start and/or end margins than specified for the symbology. These settings may increase the possibility of partial and ghost reads, hence do not use smaller margin checks than necessary. Replace any bar code labels with ones that have the correct start and end margins if possible.







Read Time Settings

ZZ	Start/End Program Menu	
Y0	0 seconds	
Y1	1 second	
Y2	2 seconds	
Y3	3 seconds	
Y4	4 seconds	
Y5	5 seconds	
Y6	6 seconds	
Y7	7 seconds	
Y8	8 seconds	
YL	Read time x 10	
YM	Indefinitely	







Read Time Settings - the length of the period that the reader is ON after the trigger switch is pressed, or (in multiple or continuous read mode) after a label has been read. Selecting a read time of 0 means that the reader will stay ON as long as the trigger switch is being pressed. Selecting a read time for readers without a trigger switch, or when the trigger switch is disabled, has no effect.

Redundant Decoding Settings

ZZ	Start/End Program Menu	
X0	No redundancy	
X1	Two times redundant	 
X2	Three times redundant	
X3	Four times redundant	





















Redundancy Settings - This is the number of times that a label must be correctly decoded before it is transmitted. Selecting a higher redundancy count makes reading slower, but it reduces the probability of reading errors, especially when labels of poor definition are used.

Positive and Negative Bar Codes

ZZ	Start/End Program Menu	
V2	Positive bar codes	
V4	Both positive and negative bar codes	 





Positive and Negative Bar Codes - Usually bar codes are printed black on white, but sometime white on black. These labels are called positive and negative, respectively.

Buzzer Settings

ZZ	Start/End Program Menu		
W8	Enable software buzzer		
W0	Disable buzzer		
W1	Single tone buzzer		
W2	High - low buzzer		
W3	Low - high buzzer		
W7	Buzzer duration 50 msec.		
W4	Buzzer duration 100 msec.		
W5	Buzzer duration 200 msec.		
W6	Buzzer duration 400 msec.		
T0	Buzzer volume maximum		
T1	Buzzer volume loud		
T2	Buzzer volume normal		
T3	Buzzer volume minimum		
VY	Buzzer before transmission		

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Buzzer Settings

ZZ	Start/End Program Menu	
VZ	Buzzer after transmission	
GD	Disable startup buzzer	
GC	Enable startup buzzer	

Buzzer Settings - These options determine the buzzer type, tone, duration and loudness. By default, the buzzer is disabled for Linker type readers.

Buzzer Type - The buzzer may be disabled or enabled as either a hardware or software buzzer. Not all readers support both a hardware and software buzzer.

Buzzer Tone - If a software buzzer is used, the buzzer tone may be selected.

Buzzer Duration and Volume - If a software buzzer is used, a buzzer duration of 50, 100, 200 or 400 msec. may be selected. Volume may also be adjusted.






Buzzer Before Transmission - The good read buzzer will be activated after decoding the bar code, but before transmission. During transmission, the buzzer sequence will be completed.

Buzzer After Transmission - The good read buzzer will be activated after transmission.

Enable Startup Buzzer - When this option is selected, the reader will generate a single good read buzzer to indicate the reader is ready after the reader is supplied with power.








Disable Startup Buzzer - When this option is selected, the reader will not sound the buzzer after the reader is supplied with power.

Good Read LED

ZZ	Start/End Program Menu	
T4	Disable indicator	
T5	Indicator duration 0.2 sec.	
T6	Indicator duration 0.4 sec.	
T7	Indicator duration 0.8 sec.	



Diagnostics

ZZ	Start/End Program Menu	
Z1	Transmit software version	
Z3	Transmit settings	
ZA	Transmit ASCII printable string	
YV	Transmit ASCII control string	
TH	Error msg. label	
TI	Error msg. no decode	

History of changes to Manual

Sept 2002

Corrected programming bar codes for Computer Type Selection (keyboard wedge).

Changed: "OPT" Series to "LGP" Series

November 2005

Added keyboard wedge and USB options programming commands